

IN THE CLAIMS:

1. (Currently amended) A data storage subsystem comprising:

a plurality of storage devices;

a storage controller coupled to said plurality of storage devices, wherein said storage controller is configured to store data in the form of stripes where each stripe includes a plurality of data blocks stored across said plurality of storage devices, wherein each stripe further includes a redundancy data block;

wherein said storage controller is further configured to initialize a given stripe in response to receiving a write request to write a new data block at a particular location of said given stripe and detecting a mismatch in block verification information associated with an existing data block at the particular location of said given stripe to be updated[[,]];

wherein, to detect a mismatch in block verification information associated with the existing data block at the particular location of said given stripe to be updated, said storage controller is configured to read the existing data block and a corresponding block verification information, generate a recomputed block verification information from data within the existing data block, and compare the corresponding block verification information to the recomputed block verification information to determine whether a mismatch exists;

wherein said storage controller is configured to initialize said given stripe by generating a corresponding redundancy data block for said given stripe based on at least the new data block to be written to said given stripe.

2. (Previously presented) The data storage subsystem as recited in Claim 1 wherein said storage controller is configured to initialize said given stripe by reading one or more remaining data blocks of said given stripe and generating the corresponding redundancy data block for said given stripe based on the remaining data blocks and the new data block.
3. (Previously presented) The data storage subsystem as recited in Claim 1 wherein said redundancy data block contains parity data calculated from said other data blocks.
4. (Previously presented) The data storage subsystem as recited in Claim 1 wherein said block verification information associated with a particular data block includes a code dependent upon data contained within said particular data block.
5. (Original) The data storage subsystem as recited in Claim 4 wherein said code is an error detection code.
6. (Original) The data storage subsystem as recited in Claim 5 wherein said error detection code is a cyclic redundancy check code.
7. (Original) The data storage subsystem as recited in Claim 5 wherein said storage controller is configured to detect a mismatch in said block verification information by comparing a value contained in a field of said particular data block for storing said error detection code to a recomputed error detection code computed from data within said particular data block read from one of said storage devices.
8. (Previously presented) The data storage subsystem as recited in Claim 1 wherein said block verification information associated with a particular data block includes an address associated with said particular data block.

9. (Original) The data storage subsystem as recited in Claim 8 wherein said address is a logical block address for said particular block.
10. (Original) The data storage subsystem as recited in Claim 9 wherein said storage controller is configured to detect a mismatch in said block verification information by comparing a value contained in a field of said particular data block for storing said logical block address to an expected value of said logical block address for said particular data block read from one of said storage devices.
11. (Original) The data storage subsystem as recited in Claim 8 wherein said block verification information of said particular data block further includes a code dependent upon data contained within said particular data block.
12. (Original) The data storage subsystem as recited in Claim 11 wherein said code is an error detection code.
13. (Original) The data storage subsystem as recited in Claim 12 wherein said error detection code is a cyclic redundancy check code.
14. (Original) The data storage subsystem as recited in Claim 1 wherein each of said plurality of storage devices is a disk drive.
15. (Original) The data storage subsystem of Claim 1 wherein said block verification information includes a block ID.
16. (Original) The data storage subsystem of Claim 1 wherein said storage controller is configured to implement RAID 5 functionality.

17. (Currently amended) A data storage subsystem comprising:

a plurality of storage devices;

a storage controller coupled to said plurality of storage devices, wherein said storage controller is configured to store data in the form of stripes where each stripe includes a plurality of data blocks stored across said plurality of storage devices, wherein at least one of the plurality of data blocks is a redundancy data block;

wherein said storage controller is further configured to initialize a given stripe in response to receiving a write request to write a new data block at a particular location of said given stripe and detecting a mismatch in block verification information in each of at least two existing data blocks of said given stripe, wherein one of the two existing data blocks is at the particular location of said given stripe to be updated[[,]];

wherein, to detect a mismatch in block verification information associated with the one existing data block at the particular location of said given stripe to be updated, said storage controller is configured to read the one existing data block and a corresponding block verification information, generate a recomputed block verification information from data within the one existing data block, and compare the corresponding block verification information to the recomputed block verification information to determine whether a mismatch exists;

wherein said storage controller is configured to initialize said given stripe by generating a corresponding redundancy data block for said given stripe based on at least the new data block to be written to said given stripe.

18. (Previously presented) The data storage subsystem as recited in Claim 17 wherein said storage controller is configured to initialize said given stripe by reading one or more remaining data blocks of said given stripe and generating the corresponding redundancy data block for said given stripe based on the remaining data blocks and the new data block.
19. (Previously presented) The data storage subsystem as recited in Claim 17 wherein said redundancy data block contains parity data calculated from said other data blocks.
20. (Previously presented) The data storage subsystem as recited in Claim 17 wherein said block verification information of a particular data block includes a code dependent upon data contained within said particular data block.
21. (Original) The data storage subsystem as recited in Claim 20 wherein said code is an error detection code.
22. (Original) The data storage subsystem as recited in Claim 21 wherein said error detection code is a cyclic redundancy check code.
23. (Original) The data storage subsystem as recited in Claim 21 wherein said storage controller is configured to detect a mismatch in said block verification information by comparing a value contained in a field of said particular data block for storing said error detection code to a recomputed error detection code computed from data within said particular data block read from one of said storage devices.
24. (Previously presented) The data storage subsystem as recited in Claim 17 wherein said block verification information of a particular data block includes an address associated with said particular data block.

25. (Original) The data storage subsystem as recited in Claim 24 wherein said address is a logical block address for said particular block.
26. (Original) The data storage subsystem as recited in Claim 25 wherein said storage controller is configured to detect a mismatch in said block verification information by comparing a value contained in a field of said particular data block for storing said logical block address to an expected value of said logical block address for said particular data block read from one of said storage devices.
27. (Currently amended) A computer system comprising:
- a host; and
- a data storage subsystem coupled to said host, said data storage subsystem including:
- a plurality of storage devices;
- a storage controller coupled to said plurality of storage devices, wherein said storage controller is configured to store data in the form of stripes where each stripe includes a plurality of data blocks stored across said plurality of storage devices, wherein each stripe further includes a redundancy data block;
- wherein said storage controller is further configured to initialize a given stripe in response to receiving a write request to write a new data block at a particular location of said given stripe and detecting a mismatch in block verification information associated with an existing data block at the particular location of said given stripe to be updated[[,]];

wherein, to detect a mismatch in block verification information associated with the existing data block at the particular location of said given stripe to be updated, said storage controller is configured to read the existing data block and a corresponding block verification information, generate a recomputed block verification information from data within the existing data block, and compare the corresponding block verification information to the recomputed block verification information to determine whether a mismatch exists;

wherein said storage controller is configured to initialize said given stripe by generating a corresponding redundancy data block for said given stripe based on at least the new data block to be written to said given stripe.

28. (Previously presented) The computer system as recited in Claim 27 wherein said storage controller is configured to initialize said given stripe by reading one or more remaining data blocks of said given stripe and generating the corresponding redundancy data block for said given stripe based on the remaining data blocks and the new data block.
29. (Previously presented) The computer system as recited in Claim 27 wherein said redundancy data block contains parity data calculated from said other data blocks.
30. (Previously presented) The computer system as recited in Claim 27 wherein said block verification information associated with a particular data block includes an error detection code.
31. (Original) The computer system as recited in Claim 30 wherein said block verification information of a particular data block further comprises an address associated with said particular data block.

32 (Currently amended) A method of operating a data storage subsystem comprising:

storing data in the form of stripes within a plurality of storage devices, where each stripe includes a plurality of data blocks stored across said plurality of storage devices, wherein each stripe further includes a redundancy data block; and

initializing a given stripe in response to receiving a write request to write a new data block at a particular location of said given stripe and detecting a mismatch in block verification information associated with an existing data block at the particular location of said given stripe to be updated[[],];

wherein said detecting a mismatch in block verification information associated with the existing data block at the particular location of said given stripe to be updated includes reading the existing data block and a corresponding block verification information, generating a recomputed block verification information from data within the existing data block, and comparing the corresponding block verification information to the recomputed block verification information to determine whether a mismatch exists;

wherein said initializing said given stripe comprises generating a corresponding redundancy data block for said given stripe based on at least the new data block to be written to said given stripe.

33. (Previously presented) The method as recited in Claim 32 wherein said initializing said given stripe comprises reading one or more remaining data blocks of said given stripe and generating the corresponding redundancy data block for said given stripe based on the remaining data blocks and the new data block.

34. (Previously presented) The method as recited in Claim 32 wherein said redundancy data block contains parity data calculated from said other data blocks.
35. (Previously presented) The method as recited in Claim 32 wherein said block verification information of a particular data block includes an error detection code.
36. (Original) The method as recited in Claim 35 wherein said block verification information associated with said particular data block further includes an address associated with said particular data block.
37. (Previously presented) The method as recited in Claim 32 wherein said block verification information associated with a particular data block includes an address associated with said particular data block.
38. (Original) The method as recited in Claim 35 wherein said detecting said mismatch in said block verification information comprises comparing a value contained in a field of said particular data block for storing said error detection code to a recomputed error detection code computed from data within said particular data block read from one of said storage devices.
39. (Original) The method as recited in Claim 37 wherein said detecting said mismatch in said block verification information comprises comparing a value contained in a field of said particular data block for storing said address to an expected value of said address for said particular data block read from one of said storage devices.
40. (Cancelled)
41. (Cancelled)

42. (Previously presented) The data storage subsystem as recited in Claim 1 wherein said storage controller is configured to initialize said given stripe by generating the corresponding redundancy data block for said given stripe based on the new data block and a known data pattern to be written to said given stripe at memory locations corresponding to one or more remaining data blocks of said given stripe.
43. (Previously presented) The data storage subsystem as recited in Claim 42 wherein the known data pattern is a pattern of all zeros.
44. (Previously presented) The data storage subsystem as recited in Claim 1 wherein block verification information is associated with each of the plurality of data blocks and the redundancy data block.
45. (Previously presented) The data storage subsystem as recited in Claim 1 wherein said storage controller is configured to initialize one or more stripes in said data storage subsystem depending upon whether write requests are received that correspond to the one or more stripes and depending upon whether a mismatch is detected in the block verification information associated with each of the one or more stripes.
46. (Previously presented) The data storage subsystem as recited in Claim 1 wherein said storage controller is configured to initialize a subset of said stripes in said data storage subsystem in response to receiving a write request to write a new data block in each of the subset of said stripes and in response to detecting a mismatch in block verification information associated with each of the subset of said stripes, and subsequent to initializing the subset of said stripes, initializing one or more remaining stripes in said data storage subsystem in response to receiving a write request to write a new data block in each of the one or more remaining stripes and in response to detecting a mismatch in block verification information associated with each of the one or more remaining stripes.

47. (Currently amended) A method of operating a data storage subsystem comprising:

storing data in the form of stripes within a plurality of storage devices, where each stripe includes a plurality of data blocks stored across said plurality of storage devices, wherein each stripe further includes a redundancy data block;

receiving a write request to write a new data block at a particular location of a given stripe; and

~~in response to receiving the write request, reading an existing data block at the particular location of said given stripe to be updated; and~~

initializing said given stripe in response to receiving the write request and detecting a mismatch in block verification information associated with ~~the~~ an existing data block at the particular location of said given stripe to be updated; [[,]]

wherein said detecting a mismatch in block verification information associated with the existing data block at the particular location of said given stripe to be updated includes reading the existing data block and a corresponding block verification information, generating a recomputed block verification information from data within the existing data block, and comparing the corresponding block verification information to the recomputed block verification information to determine whether a mismatch exists;

wherein said initializing said given stripe comprises generating a corresponding redundancy data block for said given stripe based on at least the new data block to be written to said given stripe.